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**Declaration under Rule 4.17:**

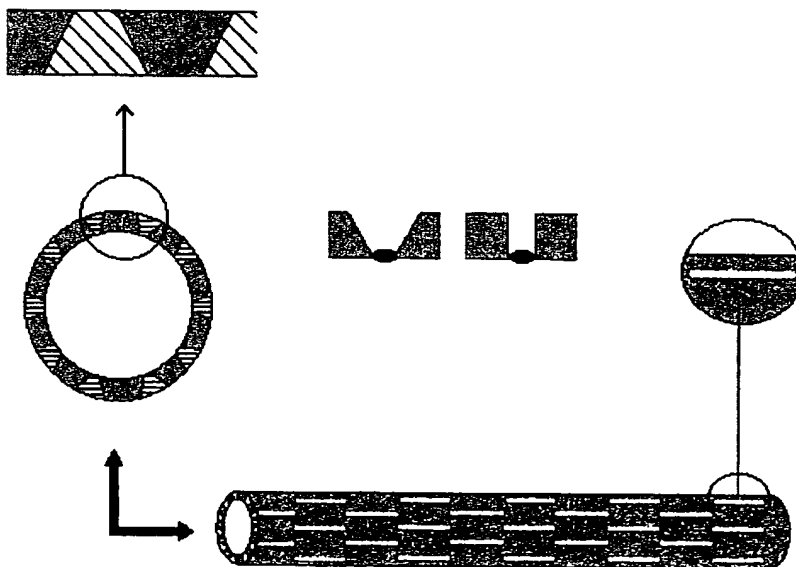
— as to the identity of the inventor (Rule 4.17(i)) for the following designation US

**Published:**

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **CUTTING PROCESS TO SIZE RIPS AT GROOVED TUBES FOR PETROLEUM ABSTRACTION IN HORIZONTAL AND VERTICAL WELLS**



(57) Abstract: It's cut process whose mainly characteristic is the substitution of the traditional cut discs by laser at the rips at grooved tubes for petroleum abstraction in horizontal and vertical wells definition, presenting rip shape change from straight to conic as the main consequence, preventing, by this, the rip block by solid residues, frequent at the straight rip, and pratically inexistent in the new rips.

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DESCRIPTIVE REPORT OF THE PATENT OF INVENTION:  
"CUTTING PROCESS TO SIZE RIPS AT GROOVED TUBES FOR  
PETROLEUM ABSTRACTION IN HORIZONTAL AND VERTICAL  
WELLS".

5           The current invention is related to a cutting process to size rips in  
grooved tubes for petroleum abstraction in horizontal and vertical wells,  
most precisely it's a technologic newness at these rip cutting process, being  
unaware of similar patented or currently used procedures.

At petroleum abstraction, vertical and horizontal tubes are inserted in the  
10 wells. Axial cuts are made at the tube surface, through whose will pass the  
embezzled liquid.

Generally discs that somehow supply the demand make these cuts.

But these discs carry through straight cuts with a single size. In this case  
some solid residue with variable thickness are suctioned within the liquid,  
15 and this grain could partially or totally obstruct the oil flux, causing a  
clogging and consequent tube change to maintenance. Besides, the  
production would be interrupted unnecessarily, and then, there would be  
liquid flow rate loss in the well.

The cutting process to size rips in grooved tubes for petroleum abstraction  
20 in horizontal and vertical wells was developed to solve these problems as  
described at the attached DRAWING.

DRAWING 01: A perspective view of a tube, pointing its lateral rip;  
presenting the details of a cut made by this process, a comparative view  
between the straight rip and the new rip made by this process.

25 As can bee seen at the report, the cutting process to size rips in grooved  
tubes for petroleum abstraction in horizontal and vertical wells attends to  
the basic newness and industrial applications necessary items for the patent  
approval.

DRAWING 02: Detail about the semi conic rip

As can be seen, the cutting process to size rips in grooved tubes for petroleum abstraction at horizontal and vertical wells will allow cuts with the desired size. Opposing to the later situation when abrasive discs made the cuts, this system will operate with laser. As the laser technology allows  
5 controlling and programming, the user will decide about the size and opening angle of the rips, and at horizontal tubes specifically the rip will be trapezoidal, with the entrance size (I) minor than the exit size so, in the case of granulated residue aspiration it will only find resistance at the outside edge of the rip (I). Besides, as the opening angle is divergent, after  
10 the grain pass the resistance it will follow the aspirated liquid. There is still the possibility of the semi conic rip using, so a parallel part with a greater dragging wear resistance can be obtained, like the DRAWING (2).

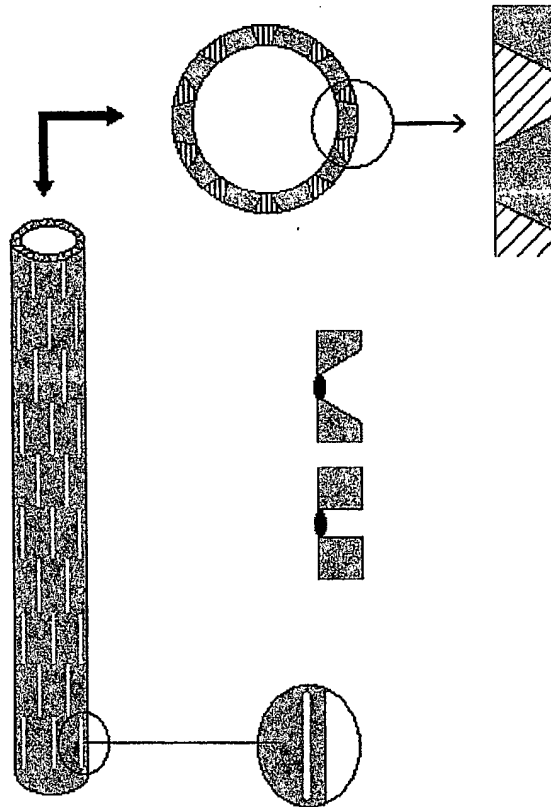
The cutting process to size rips in grooved tubes for petroleum abstraction in horizontal and vertical wells will allow the rip sizing in addition to fix  
15 the shape an the angle tendency of the rip, and can be applied to both horizontal or vertical tubes. More details about this rip can be seen in DRAWING (2). The conic shape and the straight part size can be defined by the laser parameters control

Although the cutting process to size rips in grooved tubes for petroleum  
20 abstraction in horizontal and vertical wells was first designed to petroleum abstraction industry, it can also be used for several other cutting applications at several shaped structure.

## CLAIMS

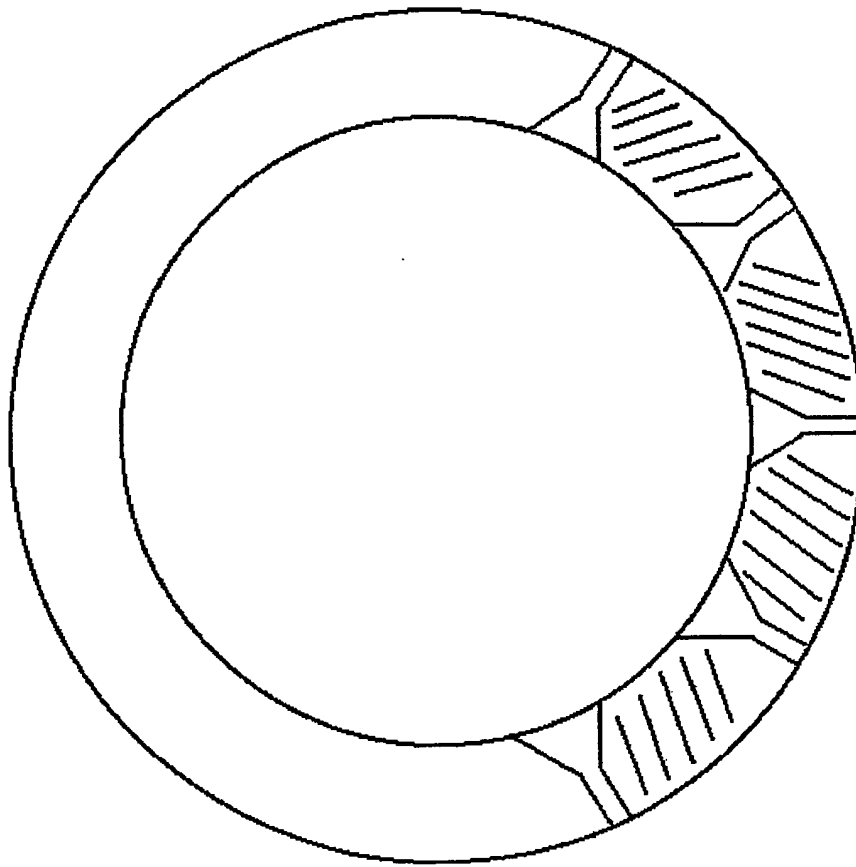
- 1 - CUTTING PROCESS TO SIZE RIPS IN GROOVED TUBES FOR PETROLEUM ABSTRACTION IN HORIZONTAL AND VERTICAL WELLS, marked by the possibility to size rips at petroleum abstraction  
5 tubes.
- 2 - CUTTING PROCESS TO SIZE RIPS IN GROOVED TUBES FOR PETROLEUM ABSTRACTION IN HORIZONTAL AND VERTICAL WELLS, accord the vindication 1, marked by the laser using to do the rips at the petroleum abstraction tubes.
- 10 3 - CUTTING PROCESS TO SIZE RIPS IN GROOVED TUBES FOR PETROLEUM ABSTRACTION IN HORIZONTAL AND VERTICAL WELLS, accord the vindication 1, marked by the possibility of substitution of the straight rip by the conic or semi conic rip at the tubes, preventing the obstruction by the accumulation of solid residues at the straight rips along  
15 the abstraction process.

-1/2-  
DRAWING 1



-2/2-

## DRAWING 2



## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/BR 03/00078-0

## CLASSIFICATION OF SUBJECT MATTER

IPC<sup>7</sup>: E21B 43/08

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>7</sup>: E21B, B21C, B23K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4343358 A ( GRYSKIEWICZ ) 10 August 1982 (10.08.82) <i>figures, description, column 1, rule 45-49.</i>	1-3
A	WO 02/34423 A1 ( NOETIC ENGINEERING INC.) 2 May 2002 (02.05.02) <i>figure 1,2.</i>	1

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

„E“ earlier application or patent but published on or after the international filing date

„L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&amp;“ document member of the same patent family

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8 September 2003 (08.09.2003)

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/BR 03/00078-0

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
US	A	4343358	10-08-1982	US	A	4317023	23-02-1982
WO	A	234423				none	